Interview with Captain Tim Flynn

The Space and Naval Warfare Systems Center San Diego is the U.S. Navy's research, development, test and evaluation, engineering and fleet support center for command, control and communication systems and ocean surveillance. SSC San Diego provides information resources to support the joint warfighter in mission execution and force protection.

CHIPS asked Capt. Flynn, former commanding officer of SSC San Diego and acting SPAWAR vice commander to talk about the exciting mission of SSC San Diego.

Capt. Flynn has been nominated for appointment to the rank of rear admiral.

CHIPS: Can you talk about some of the initiatives SSC San Diego has in building FORCEnet?

Capt. Flynn: SPAWAR's instantiation of FORCEnet is to use a composeable approach to net-centric publishing and subscribing in a services-oriented architecture. The architecture is based on open, commercial standards. The operational impact of FORCEnet is the ability to support changing mission needs, to increase a commander's situational awareness, to give the commander the ability to 'geo-collaborate.'

The ability to actively share information and collaborate on a map (what we call 'map chat') is one of the unique capabilities that reduces the decision-cycle time for 'speed to decision,' and provides the commander a reconfigurable decision center. Many command centers are going to be around for years. As the missions flex and commanders change, the current commander will want to be able to reconfigure his or her command center.

In delivering FORCEnet capabilities, SSC San Diego's primary contribution is Composeable FORCEnet or 'CFn,' which basically provides the capability or services for the warfighter to obtain information from local and remote locations through a 'publish and subscribe' mechanism.

Users are not constrained to just C2 (command and control) information that their units develop nor are they constrained to depending on other users sending them information. CFn enables information to be organized into knowledge then shared with other local or remote users through map chat collaboration. Map chat also enables virtual teaming. It started in the fleet as text chat. Now taken to the next level, map chat enables geospatial collaboration.

We also provided Web patron services through which CFn translates data from multiple sources into a format that is accessible to any user on that domain. This will enable integration of multiple data types into a single view, including data sources that are outside the domain of the WebCOP or GCCS-M (Global Command and Control System—Maritime) program. You can actually subscribe to PC IMAT (Personal Computer Interactive Multi-Sensor Analysis Training) or AREPS (Advanced Refractive Effects Prediction System) or GALE Lite for the signal intelligence piece of the puzzle.

Soon METOC (weather) information will be available as a subscriber service. Users sitting at existing workspaces, such as the theater ASW (antisubmarine warfare) watch floor at CTF-74 (Commander, Task Force 74) are now able to view data from non-GCCS-M systems and other data sources via a browser with a CFn plug-in. These are the key capabilities. There are three views. First, there is the geospatial view, a three-dimensional view of the objectified area of interest to the combatant commander. There is a temporal view which allows commanders to archive, replay and reconstruct much like a videocassette recorder.

There is also the functional view. This is the Knowledge Web or the portal piece. Included within the client capabilities is the ability to collaborate by map chat. From the services side, the capabilities include an information broker, a translation service, a bandwidth management capability and intelligent agent technologies that allow commanders to actually launch intelligent agents to data-mine and bring back information of interest. There are also some legacy system interfaces.

With Composeable FORCEnet, you can use databases that are not normally accessible. This is done through coding or scripts that allow users to access databases by publishing XML (Extensible Mark-up Language). In this way, the XML tags can be subscribed to over the Internet in a CFn environment.

CHIPS: Has the FORCEnet vision changed ocean and littoral surveillance and reconnaissance systems and technology?

Capt. Flynn: It is changing as we speak. SSC San Diego has been in ocean surveillance work for more than 40 years. Maritime C4ISR is the biggest part of our mission. In the area of ocean surveillance, the focus for decades has been on off-board and distributed sensors and systems. SSC San Diego's expertise includes building sensors, and — most importantly — integrating those sensors across multiple platforms that operate from the seabed to space. This is not only for the Navy but for the joint warfighter and other agencies. The FORCEnet vision is not platform-centric. Distributed sensors and capabilities, including unmanned systems and manned platforms, are all nodes on the network.

We see an increased emphasis in networking ISR systems across domains (undersea, surface, air and space) and also across

functional areas (such as acoustics, electromagnetic, radar, electro-optical and infrared). From a technology point of view, this has driven an increased emphasis in areas such as intelligence fusion and correlation. We have also seen an increased emphasis in rapidly deployable systems. For example, on the Littoral Combat Ship, you will see the ADS (Advanced Deployable System) as part of its lightweight off-board sensor capability.

FORCEnet requires adherence to an open architecture with commercial standards that will enable surveillance and reconnaissance systems to publish their information so that users can easily subscribe to that information. This will enable the warfighter to get the right information where it is needed most. It will also enable the insertion of new technology more rapidly without the massive reengineering and integration efforts that we have experienced in the past.

CFn enables the warfighter to 'plug-and-play' or as Admiral John Nathman (Commander, U.S. Fleet Forces Command and Commander, U.S. Atlantic Fleet) called it, 'plug-and-fight.' We are actively supporting the development of the FORCEnet architecture for ocean surveillance and other mission areas.

CHIPS: CHIPS published an article about the Composeable FORCEnet Human Systems Integration (CFnHSI) Laboratory (http://www.chips.navy.mil/archives/04_summer/Web_pages/FORCEnet.htm) last year. What are some of the new developments in HSI?

Capt. Flynn: Human Systems Integration work is core to the development of every C4ISR capability. Our design work is less about technology insertion and more about first understanding the operator's processes end-to-end, then working alongside the operator to reengineer processes and leverage state-of-the-art technologies to enhance situational awareness and enable 'speed to decision.'

You really see the return on investment when you first evaluate the processes, eliminate unnecessary workload, then exploit the best of breed technology. The biggest cost-driver across the design-life of a ship is the cost of manpower. We see the same thing in command centers. There is a real need to minimize the workload on the operator. This will enable a corresponding reduction in the crew size. Our human factors and knowledge management scientists are at the forefront of this for Navy and joint C4ISR.

CHIPS: Is San Diego doing any work with IPv6?

Capt. Flynn: We have been working on IPv6 since 2001, conducting research as a result of our major involvement in coalition interoperability. In 2001, the Communications and Information Systems Department was tasked by ONR (Office of Naval Research) to lead an international group of scientists and engineers from the United Kingdom, France, Germany, Canada and Italy to investigate international interoperability with IPv6 networks. Our program is called the Interoperable Networks for Secure Communications Group.

As part of this program, SSC San Diego has participated in IPv6 demonstrations with NATO countries. We have extensive experience with solving IPv6/IPv4 heterogeneous wide-area network problems.

SSC San Diego employees working in the Composeable FORCEnet Human Systems Integration (CFnHSI) Laboratory.

Our tasking includes work in: architectures, quality of service, routing, mobility, management, security, etc. Some of our recent IPv6 tasks include next generation IP naming and addressing and work on the Global Information Grid (GIG). Recently, in support of SPAWAR 05 Office of the Chief Engineer, which is the Navy's lead for IPv6 transitions, we are now writing the Navy's part of the Department of Defense Transition Plan to IPv6.

At SSC San Diego, Dr. Albert Legaspi is leading a cross-SPAWAR team to develop the Navy's IPv6 technical transition strategy. This team has participated in many DoD working groups and has had a major influence on DoD's IPv6 transition strategy. Lastly, we currently have two of our scientists, Dan Greene and Robert Kolesar, developing IPv6 test tools for OSD (Office of the Secretary of Defense).

CHIPS: Last summer CHIPS published an article about NETWARS and network warfare simulation (http://www.chips.navy.mil/archives/04_summer/Web_pages/NETWARS.htm). Are there any new developments in this area?

Capt. Flynn: Network Warfare Simulation or NETWARS is the Navy's networking, modeling and simulation tool based on optimized networking, populated with validated communications and network models from all the services. The complex set of NETWARS tools is used to accept the new network architectures and determine performance of any modifications made or proposed to existing networks.

Recently, NETWARS has been federated with the Naval Simulation System (NSS). This is a high-level tool that assumes limited communication models. It is used to determine courses of action, campaign directions, experiments, etc.

With the fidelity of NETWARS communications, coupled with the high-level campaign direction of NSS, the Navy has a much better

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understanding of how to allocate its resources for the highest return-on-investment. Some NETWARS tools are now being used by OPNAV N71.

CHIPS: What are some of the ways that SSC San Diego has contributed to fleet readiness?

Capt. Flynn: SSC San Diego contributes to the fleet, specifically readiness, in three areas. Our Distance Support Office is our first line of support. It manages requests for technical assistance very similar to a customer support office at a product manufacturer.

These requests for assistance come in from around the world by message, e-mail and sometimes telephone. So far this year, our office has responded to more than 7,200 distance support requests. If a shipboard or shore facility equipment casualty can be resolved by this office, money does not have to be spent to fly a technician or team of technicians to the affected ship or shore facility. In the event a technical issue cannot be resolved by e-mail or telephone, one of our technicians will have to be sent to correct the problem.

Our Fleet Support Office manages the technical support effort that requires sending technicians to the ship or shore facility. So far this year, this office has provided more than 170 on-site technical assists worldwide. The third part is the Installation Management Office, which manages the installation of C4ISR systems on ships, submarines and Navy shore facilities both in CONUS and Hawaii, Japan and Guam. The office will complete between 400 and 500 C4ISR system installations and upgrades each year.

CHIPS: Is there any other SSC San Diego project you would like to talk about?

Capt. Flynn: FORCEnet is really the focus, not only of SSC San Diego but also of the SPAWAR enterprise. FORCEnet is not just Navy — it's joint. Efforts are ongoing to align with the Air Force's C2 Constellation and eventually with the Army's LandWarNet. It is the Navy's implementation of the GIG. All the services are converging on the GIG.

FORCEnet is in line with U.S. Joint Forces Command's Joint Command and Control (JC2) vision. We fully expect FORCEnet to expand to include our coalition partners and other agencies. We have some challenges to overcome with multi-level security, joint information domain exchange and the ability to move data from NIPRNET to SIPRNET to JWICS (Joint Worldwide Intelligence Communications System).

Composeable FORCEnet is currently deployed in 7th Fleet. Last year, CFn was installed on the watch floor of CTF-74 in Yokosuka, Japan. Installations at Kadena and Misawa and aboard USS Blue Ridge and USS Kitty Hawk followed.

This August, SSC San Diego is installing CFn aboard USS Ronald Reagan. For the first time, CFn, installed as part of GCCS-M, will be able to subscribe to combat systems data from the ASW module. In our Interactive Multi-Sensor Analysis Training Lab, Fleet ASW Command just completed training the Destroyer Squadron Seven watchstanders on their new CFn capabilities. With PEO C4I and Space and PEO Integrated Warfare Systems, SSC San Diego is breaking new ground here.

Thus far, CFn has primarily (and appropriately) focused on the warfighter, particularly in the ASW mission area. Because of its composeable nature, CFn can also transform other warfighting mission areas as well as warfighter support areas, such as logistics, training, manpower, disaster recovery, etc. The potential is far-reaching. CHIPS

Captain Tim Flynn is the former commanding officer of the Space and Naval Warfare Systems Center, San Diego. He has been nominated for appointment to the rank of rear admiral.

Capt. Tim Flynn received his commission upon graduating from the U.S. Naval Academy with a Bachelor of Science degree in marine engineering in 1979 and completed nuclear propulsion plant operator training in 1980. He was later awarded Master of Science degrees in National Security Affairs (technical intelligence) and mechanical engineering from the Naval Postgraduate School.

Captain Flynn's sea assignments include service as damage control assistant in USS Truxtun (CGN 35), First Lieutenant and Reactor Training Assistant in USS Arkansas (CGN 41), operations officer in USS Paul F. Foster (DD 964), chief engineer in USS Texas (CGN 39), and chief engineer in USS Harry S. Truman (CVN 75). He qualified as a Surface Warfare Officer and was designated as "Qualified for Command at Sea." He became an Engineering Duty Officer in 1992.

His shore assignments include special projects officer at Joint Task Force Five; assistant project officer for New Construction Aircraft Carriers at Supervisor of Shipbuilding, Conversion and Repair, Newport News, Va.; assistant program manager for In-Service Carriers, including Smart Carrier, at Aircraft Carrier Program Office (PMS 312) at Naval Sea Systems Command, Washington, D.C.; and Director of Shore C4ISR Installations; followed by executive assistant at Space and Naval Warfare Systems Command, San Diego. He assumed command of Space and Naval Warfare Systems Center, San Diego, on 2 May 2002.

Capt. Flynn is the acting SPAWAR vice commander.

His decorations include the Meritorious Service Medal (four awards), the Joint Commendation Medal, the Navy Achievement Medal (three awards) and multiple unit commendations.